



# Centered on Service

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## Environmental Challenges Evolve on the Eve of the 37th Earth Day

It seems almost incredible! April 22, 2007, will mark the 37th anniversary of the first Earth Day.

The first Earth Day marked the midpoint of two decades of growing environmental awareness, activism, and legislation. In 1962, Rachel Carson's book, *Silent Spring*, brought attention to the threats posed by indiscriminate use of chemical pesticides to wildlife. Ms. Carson, who worked for the U.S. Bureau of Fisheries, now the U.S. Fish and Wildlife Service (USFWS), testified before Congress, which banned the pesticide DDT. (For more information, see [www.fws.gov/rachelcarson/](http://www.fws.gov/rachelcarson/)).

In 1966, the U.S. Congress passed both the National Historic Preservation Act (NHPA) and the U.S. Department of Transportation (USDOT) Act. The NHPA



*California fan palm oasis, part of the Coachella Valley Habitat Preservation Initiative, Riverside County, CA.*

*Photo source: Stephanie M. Stoermer, FHWA*

established the Section 106 process, which requires Federal agencies to consider the effects the projects will have on historic properties. The USDOT Act required rigorous alternatives analysis before public

## TECHNICAL ASSISTANCE

### FHWA Accelerates TRANSIMS Deployment: Application Areas and User Community Broadened

TRANSIMS (Transportation Analysis and Simulation System) was initially designed and developed by the Los Alamos National Laboratory with funding from US DOT and EPA. It is an agent-based simulation system capable of simulating every person and every vehicle in a metropolitan area on a second-by-second basis throughout a regional transportation network.

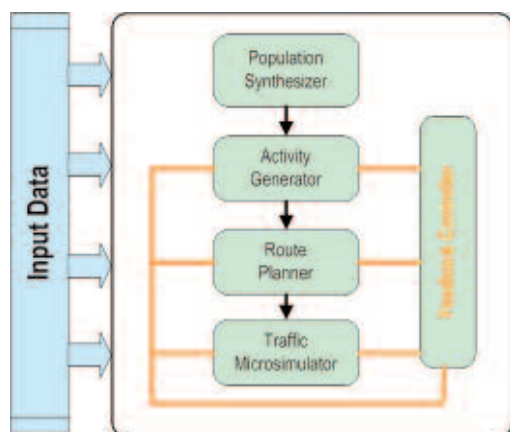


Figure 1: TRANSIMS Framework

TRANSIMS consists of several core integrated modules (see Figure 1):

- Population Synthesizer
- Activity Generator
- Route Planner
- Microsimulator
- Feedback Controller

TRANSIMS has employed completely new sets of principles and advanced techniques as compared to conventional travel demand forecasting procedures.

The Federal Highway Administration (FHWA) is currently accelerating TRANSIMS deployment to broaden its application areas and user community. Section 5512 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) called for a continuation of

TRANSIMS deployment and methods development to demonstrate a wide spectrum of TRANSIMS applications that support local, metropolitan and statewide transportation planning.

In August 2006, the FHWA issued a Broad Agency Announcement (BAA) requesting proposals to expand the TRANSIMS deployment to areas representing a diversity of population, geographic regions and analytical methods. The major goals of these new projects are to prove TRANSIMS as a viable approach in forecasting travel; to demonstrate TRANSIMS' ability to solve specific problems, such as congestion or emergency evacuation; and to foster continuous TRANSIMS deployment after SAFETEA-LU.

Two proposals were selected from the Announcement:

- TRANSIMS Implementation in Chittenden County, Vermont
- Application of TRANSIMS for the Simulation of the New Orleans Emergency Evacuation Plan

Supin Yoder from the FHWA Resource Center Planning Technical Service Team has been selected by Headquarters as the Project Manager for the Chittenden MPO TRANSIMS Study. Yoder has worked closely with Fred Ducca and Brian Gardner from Headquarters in setting up the project. Ducca and Gardner have extensive experience in managing, implementing and advancing TRANSIMS technology, and they look forward to working with Yoder as the project progresses.

The project will demonstrate if a small urban area can effectively use the TRANSIMS technology to provide more accurate travel forecasts for planning applications. The scope of work includes the following:

- Converting the traditional trip based model to TRANSIMS
- Implementing TRANSIMS technology
- Testing TRANSIMS sensitivities under various future land use/network scenarios
- Comparing TRANSIMS outputs with those produced from the existing MPO four-step model and the PARAMICS micro-simulation model

See **TRANSIMS** on page 4

## Riprap Design Criteria, Recommended Specifications, and Quality Control Report Complete



NCHRP Report Number 568 – ***Riprap Design Criteria, Recommended Specifications, and Quality Control*** has now been completed.

This report has taken a comprehensive look at many of the riprap design techniques used in recent years and makes recommendations on which technique to use in which situation. In addition, it also presents a set of recommended specifications for rock type, durability, extent, and placement. There is also a series of standard plans available in several different formats for a number of different types of riprap installations. The publication may be downloaded at:

**[www.trb.org/news/blurb\\_detail.asp?id=7023](http://www.trb.org/news/blurb_detail.asp?id=7023)**

The publication contains download links to typical details for the riprap applications investigated, including:

- Guide bank
- Revetment riprap
- Riprap apron at vertical wall abutment
- Riprap at piers
- Riprap at spill-through abutments
- Riprap spill-through slope and apron
- Sand-filled geocontainers as filter for pier riprap

Please download a copy of this report for your use and share with others as necessary.

For more information on NCHRP Report No. 568, please contact:

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## LRFD Design Bridge Specifications *4th edition now available!*

The American Association of State Highway and Transportation Officials (AASHTO) has issued LRFD Bridge Design Specifications, 4th edition. The issuance of these specifications is a major step in fostering improved bridge design. For example, the more accurate structural analysis that results is expected to lead to bridges exhibiting superior serviceability, enhanced long-term maintainability, and more uniform levels of safety. Among other updates, this edition includes newly updated foundation specifications.

Based on the load and resistance factor design (LRFD) philosophy, this product is the result of a 5-year research effort under AASHTO's National Cooperative Highway Research Program (NCHRP) Project 12-42, and a continued effort through AASHTO technical committees. Since the 1st edition was published in 1994, the provisions have continued to be updated and improved based on continuing research and the experience of the user community. The new specifications have been systematically tested in trial designs, and are now fully implemented by 17 States, and partially implemented by the remaining AASHTO member bridge departments. This 4th edition supersedes all previous editions and interims.

As of October 2007, the States have agreed to use the LRFD bridge design code for all projects using Federal funding. The single-user CD-ROM version contains both the standard and metric editions of the AASHTO LRFD Bridge Design Specifications, 4th Edition, and is available with the published/printed version. It includes the following features:

- Navigation menu & toolbar
- Hyperlinked ASTM citations
- Hyperlinked & bookmarked articles, figures, tables & equations
- Quick help
- Hyperlinked index
- Full-text search
- U.S. customary & Scientific Instrumentation menus

You can order this AASHTO publication by calling 1-800-231-3475 or visiting the online bookstore at, <https://bookstore.transportation.org/>.

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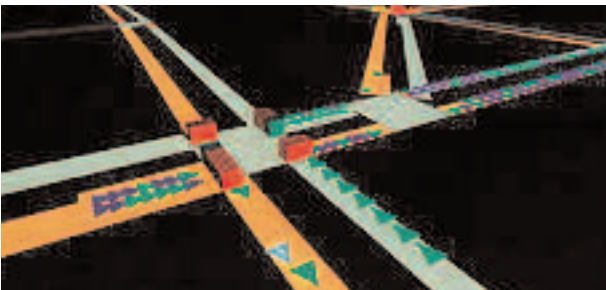
Based on experiences in Portland and other case studies, a two-phased TRANSIMS implementation approach has been adopted for this project.

Phase I focuses on just the TRANSIMS Route Planner and Microsimulator, supplemented with origin-destination trip tables produced from the conventional trip based models.

Phase II devotes resources to the Population Synthesizer and Activity Generator of the full TRANSIMS implementation. The two-track approach allows users initially to concentrate on network conversions, equilibrium between the Router and Microsimulator and associated feedback loop structures. The project will last 18 months and will be completed in 2008.

In addition, Yoder has also initiated another TRANSIMS project in DuPage County, located within the Chicago metropolitan region. With support from Headquarters, she wrote the project proposal, which was recently endorsed by DuPage County. Yoder will serve as chief modeler to convert the DuPage TransCAD and Synchro models to TRANSIMS. The project will evaluate if the TRANSIMS modeling approach can add value to assess the impact fees program currently implemented in DuPage County.

Other TRANSIMS activities include the Portland Methods Development Study, the White House Area Transportation Study, the Rutgers University/ New Jersey Institute of Technology study of traffic in Central New Jersey, Simulations of New Orleans Evacuation Plans, the Chicago Downtown Evacuation Study, the Buffalo Area Cross-Border Freight Study, TRANSIMS Open Source License Management and NHI training course development.



TRANSIMS Simulation

Further information on TRANSIMS can be obtained at <http://transims-opensource.net/index.php>. The source code is available from <http://sourceforge.net/projects/transims/>

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## TECHNOLOGY DEPLOYMENT

### UPDATE: Product Demonstration Showcases

Product Demonstration Showcases demonstrate a remarkable range of technologies including solutions implemented by enterprising local agencies. Each showcase demonstrates both the realized and future potential for substantial cost savings. Showcases provide for substantial interaction and each day concludes with a 1-hour open forum discussion. These are the most efficient, cost-effective information exchange opportunities you will ever experience. We know from previous showcases that every one offers the potential to return your participation investment many times over. Take advantage of these remarkable opportunities and bring along your decisionmaking team.

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### **Status of Planned Showcases:**

#### **Vancouver Corridor Safety Program August 23 and 24, 2007 - Vancouver, WA**

Maintaining vehicle and pedestrian safety is a major challenge, but moving promising safety initiatives from the planning room into actual practice has also proven to be a daunting task for safety experts. Consequently, many States are tapping into the Corridor Safety Program (CSP). This program works to reduce collisions on roadways by employing low-cost, near-term solutions through the use of engineering, enforcement, education, and emergency services partnerships. The program is locally coordinated in each community, and involves interested citizens along with businesses and agencies that have a vested interest in the safety of their roadways.

Washington is one such State. What makes the Washington State Department of Transportation's (WSDOT) effort unique is a high level of integration of all safety interests throughout the entire process. Citizen and business groups, law enforcement, engineering, education, and emergency management service safety professionals all play vital roles in the planning, development, and construction process. Most importantly, their involvement is key to sustaining the effort over the long-term. Not only have Federal and State agencies bought into the concept, but the State has also been able to get local communities involved in their CSP.

If you're interested in seeing how this might work in your State, you are invited to participate in a Product Demonstration Showcase of the WSDOT process, August 23 & 24, 2007 in Vancouver, WA. This event is co-hosted by the City of Vancouver, WA, WSDOT, and both the Washington and Utah Local Technical Assistance Programs (LTAP). It will cover all aspects of the process that was used to bring the CSP to life – how all the parties were approached, the challenges faced and how participation, planning, design and jurisdictional obstacles are overcome. Each partner will speak to their role and responsibilities. Interactive classroom presentations will be followed by three real-time field sites, including a 16-mile rural safety corridor along the Columbia River, to highlight original conditions and resulting solutions. This two-way information sharing experience will also allow participants to share solutions that WSDOT could consider.

### **Upcoming PDS under development:**

- ACS Lite (in Houston, TX) – Focus on traffic signal timing solutions for small and medium-size communities. ACS Lite software continuously monitors traffic signals as well as the flow of traffic and adjusts signal timing accordingly. A PDS development meeting is planned for May 22, 2007.
- ADA Compatible Roundabouts (in San Diego) – San Diego has a very active disabled community that has traditionally opposed roundabouts. In fact, in February 2001, the City Manager's Subcommittee for Removal of Access Barriers passed a motion which called for all design and/or construction of roundabouts within San Diego to be stopped until further research was available to demonstrate safety for pedestrians who have disabilities. This showcase will present the process and lessons learned from the City of San Diego's implementation of its first modern roundabouts and how accessibility concerns were addressed in the development of the projects. The PDS contract will be awarded in early May.

### **Future PDS Topics:**

- Jointbond PDS (Tennessee DOT in Nashville) – Jointbond is a Polymerized Maltene Emulsion formulated to penetrate the longitudinal joint area quickly and fortify the weakest area in new asphalt construction. There is a development meeting scheduled for April to discuss the date of the PDS.



- Maintenance Decision Support System (MDSS) – A tool that uses weather forecasting and data fusion techniques to provide maintenance managers precise surface condition forecasts and treatment recommendations thus reducing maintenance costs for winter operations. Logistics are still being worked out.

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# FHWA's EMIT Model Simplifies Air Quality Analysis

A tremendous amount of effort is expended in the United States every year to conduct air quality analysis of transportation plans and projects. Most of this analysis is conducted for NEPA documents or air quality conformity determinations, although State and local air pollution agencies also generate estimates of motor vehicle emissions for air quality planning purposes. To make this process easier, the FHWA Resource Center Air Quality Team developed the Easy Mobile Inventory Tool (EMIT).

Until now, the tool of choice for mobile source air quality analysis has been the Environmental Protection Agency's MOBILE6.2 model (except in California, which has its own emissions model). MOBILE6.2 is a

Fortran-based model that runs in DOS; input files are generated by hand in a text editor (like Notepad). This cumbersome process makes it difficult and time consuming to perform transportation air quality analysis.

EMIT is built to operate in a Microsoft Windows environment. EMIT incorporates EPA's MOBILE6.2 model along with several other functions that make setting up the model and getting results much easier. One major improvement that EMIT offers over MOBILE6.2 is the ability to enter input data in forms, rather than typing out text files (*see below*).

## EMIT provides many other improvements over MOBILE6.2

**Multiple modes of operation:** MOBILE6.2 is an "emissions factor" model; it provides estimates of emissions from the average vehicle in terms of grams

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EMIT Model Opening Screen

## EMIT from page 6

per vehicle mile. In addition to generating emission factors, EMIT can also be used to 1) generate estimates of total emissions for a given project or area, or 2) develop speed look-up tables of emissions rates by speed.

**Error checking:** EMIT provides some error checking to alert the user to invalid or out-of-range inputs as data are being entered on the forms. MOBILE6.2 does not do this; with that model, the user is left to search for errors in the text input file after the model refuses to run.

**Development of annual emissions inventories:** For pollutants like particulate matter and mobile source air toxics, estimates of annual emissions are often needed. Without EMIT, modelers are forced to run MOBILE6.2 multiple times (reflecting different seasons or months) and then average the results by hand. EMIT can perform these calculations automatically, for several different time scales.

**Calculation of vehicle speeds:** Speeds are an important input to the emissions calculation process, and MOBILE6.2 users must provide their own speed estimates. EMIT provides two different methodologies for calculating speeds based on project vehicle miles traveled and lane-miles data, and will automatically set up MOBILE6.2 to run those speeds. Speeds can be broken out by hour (which is important for analysis of congested conditions) and even direction of travel. By contrast, performing this level of detailed speed analysis by hand involves hours of tedious spreadsheet work.

**Modeling of highway emissions or total vehicle emissions:** MOBILE6.2 calculates emissions from vehicles as they operate on roadways, and also other emissions that typically do not occur on roadways (excess emissions from engine starts, evaporative emissions from parked cars). In EMIT, the user can choose whether to model total emissions, or just those emissions that occur on roads.

**Useful output options:** As noted above, MOBILE6.2 only reports emissions factors in grams per mile. EMIT provides other, more useful reporting options, including summary tables and graphs.

The processing steps EMIT uses to generate emissions estimates are as follows:

- 1) The user enters project-specific data into the EMIT forms

- 2) For emissions inventories, EMIT calculates speeds based on the user-provided travel data
- 3) EMIT writes a MOBILE6.2 input file reflecting these speeds and other user inputs
- 4) EMIT runs MOBILE6.2
- 5) EMIT reads the MOBILE6.2 output and calculates emissions
- 6) EMIT generates reports, summary tables, graphs, and MOBILE6.2 printouts.

The FHWA designed EMIT to be transparent, rather than a “black box.” EMIT users can save copies of MOBILE6.2 input and output files for reviewing agencies and the project record.

EMIT does have a couple limitations compared to MOBILE6.2. First, EMIT can run only one calendar year at a time, unlike MOBILE6.2, which can run multiple calendar years. Also, EMIT does not support some MOBILE6.2 input parameters where EPA recommends use of national defaults. (In cases like these, users can still run EMIT to generate a MOBILE6.2 input file reflecting the rest of the inputs, save the file, and then edit it to add any remaining inputs that are not supported by EMIT.)

In short, EMIT is a tool that can greatly simplify air quality analysis in the transportation world. It can also allow for more sophisticated air quality analysis while still requiring less time. EMIT has already been used on some real-world projects, and FHWA Resource Center staff are available to provide advice and assistance on use of this model.

To get a copy of the model, or if you have more questions, contact:

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## TRAINING

# Pedestrian Safety Focus State Reaps Benefits of New Style of Distance Learning



The Resource Center Safety and Design Technical Service Team (TST) is making good use of alternative training methodologies to meet the needs of its customers. An example of this is the new distance learning course --

***Developing an Effective Pedestrian Safety Action Plan*** -- developed by Safety Specialist, Peter Eun.

When California, a pedestrian safety focus State (see box below), approached the Resource Center to request a series of 22 training sessions, the Resource Center staff realized it had to be creative in order to meet the State's needs. While each of the 13 pedestrian safety focus States had originally been slated to get 1-2 weeks of training, this allotment would not accommodate California's request. Safety and Design Team Leader Pat Hasson and Peter Eun contacted the Knowledge Application Team (KAT) at the National Highway Institute and began creating a distance learning program to deliver the *Developing an Effective Pedestrian Safety Action Plan* course online. In July 2006, after 6 months of work, the pilot was launched.

## The Focused Approach to Safety

The FHWA Safety Offices (HQ, RC, TFHRC, Divisions) employ a data-driven approach to safety that targets resources to those States that have combined higher absolute fatality numbers and fatality rates (fatalities per 100 million vehicle miles traveled) in the areas of roadway departure, intersections, and pedestrian fatalities.

There are 13 pedestrian focus States (AZ, CA, FL, GA, HI, IL, MI, NC, NJ, NM, NY, PA, TX) and 5 focus cities (Chicago, Detroit, Los Angeles, New York City and Phoenix).

Eun gives major credit to the Office of Corporate and Professional Development's Debbie Gwaltney and Susan McDonald Osborn for making the distance learning class come to fruition. Eun and Osborn spent 6 months putting the course together but never met in person. So even the development of the pedestrian course was a lesson in using technology to overcome distance—the entire project was done via Internet and telephone.

The result of Eun's collaboration with the KAT is a leap forward in the use of online training programs. The structure thoughtfully combines online, interactive training and off-line self-study assignments. The pedestrian course is designed with five modules that take place over 2 weeks.

The first module is a one-hour, real time, web-based session led by the course instructor that gives participants general instructions and an overview of the distance learning process. The students are then given a reading assignment to complete on their own time. Session 2 is a pre-recorded, self-paced, online training module. This second session includes a series of questions for the participant to answer during the session - a quiz of sorts. Session 3 is in an interactive web meeting format like the first session. This session is longer - 3 ½ hours and includes a question and answer session with subject matter experts and group work. Another reading assignment and a second self-based training module (Session 4) follows. The fifth and final session of the course is another interactive web-based meeting and includes a virtual field trip, more group work, and an expert panel question and answer session.

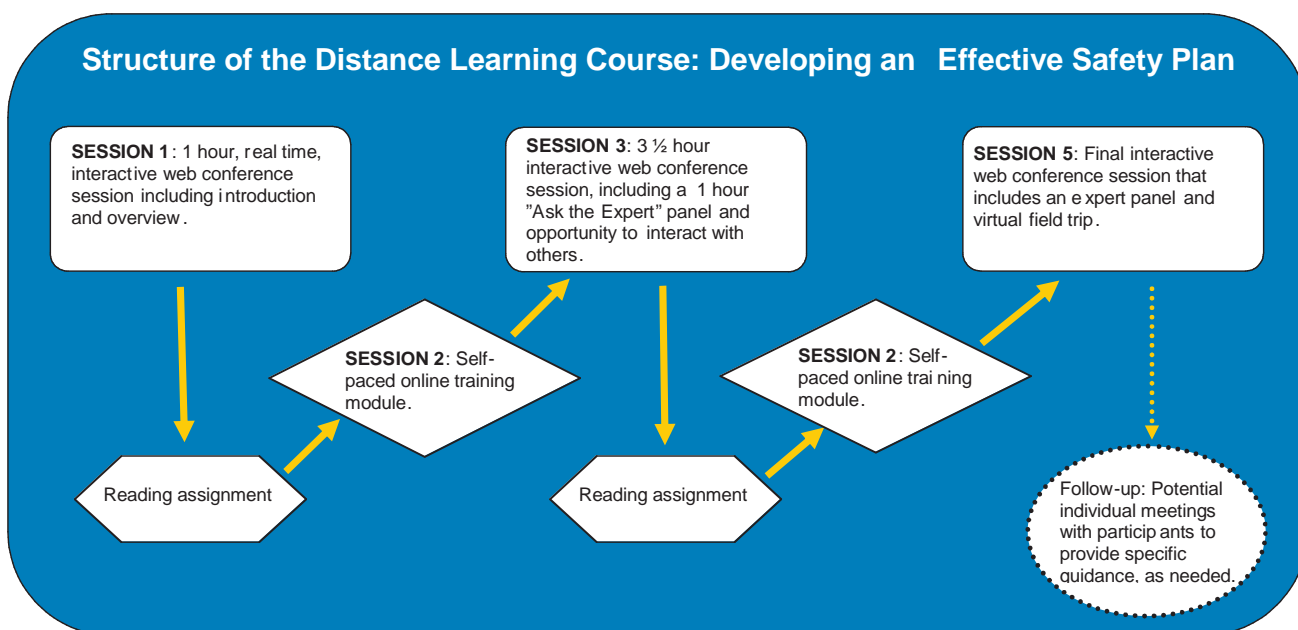
At the completion of the training session, participants can schedule follow-up meetings to discuss pedestrian plans for the participant's State. These follow-up sessions may use Breeze web conferencing software.

How well is the new course being received? So far, it is being well received in California and future sessions will be scheduled. The web based training sessions are designed to reinforce what has been read, provide supplemental information and to answer some questions.

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## LEARNING from page 8



The benefits of the structure of this type of distance learning course are many – including that there is no need to commute or travel to participate. Students can even sign into the sessions from home, if they need to. And, unlike traditional, self-paced, computer-based training modules, the students have opportunities to ask questions of experts, peers, and the instructor.

Some 20 students took part in the original pilot and 24 more were in the second session (both in California). Future sessions will be limited to 20-24 participants in order to keep the group work and discussions manageable. State or division personnel who are interested in signing up for a future session of the course should contact Eun or their respective FHWA Division Offices to schedule their participation. Those in focus States have priority in enrollment, but some slots may be available for non-focus States.

California is currently receiving a combination of live and distance learning sessions and this combination should meet their needs effectively, despite limited resources.

What's next? Eun is currently the lead instructor for the online pedestrian course, but Safety & Design teammate Keith Sinclair will soon begin leading the course as well. Eun is currently working on his next distance learning course: **Designing for Pedestrian Safety**. This class is expected to be piloted sometime in late 2007.

Other members of the Safety & Design TST are starting work on their own distance learning projects. Dean Larsen and Gene Amparano are partnering to develop a **Low Cost Safety Improvements** course. Mark Doctor and Jeff Shaw are converting the **Fundamentals of Geometric Design** course.

Divisions are also picking up on the benefits of distance learning. For example, Aida Berkovitz, Peter Eun and Washington Division Office Civil Rights Program Manager Jodi Petersen are converting the **Designing Pedestrian Facilities for Accessibility** course. Eun also assisted Ken Kochevar and Jeff Lewis of the California Division Office in converting the **California Emergency Relief** training which was launched in January of 2007.

With the popularity of distance learning and web conferences, the Resource Center Safety and Design TST has opted to form a team to assist in the development of distance learning courses as well as assistance in setting up web conferences.

For more information on these distance learning courses contact:

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## EARTH DAY from page 1

parks, recreation areas, wildlife refuges and historic sites could be used for transportation projects. This process, known as Section 4(f), remains one of the most important environmental provisions affecting transportation projects.

In 1969, the U.S. Congress passed the National Environmental Policy Act, which guides the environmental review process for Federal actions. It remains one of the most important laws governing the development of transportation projects.

The 1970s brought about more important legislation. The Clean Air Act, the Clean Water Act, and the Endangered Species Act are just three of the laws that transportation agencies work with daily.

What progress can we celebrate after 37 years? There is no question that our nation's air and water are cleaner now. While much work remains, some of our most storied and celebrated wildlife species are recovering from the brink of extinction. For example, in 2005, the USFWS proposed removing bald eagles from the threatened and endangered species list as their populations continue to rebound. The pesticide DDT, the threat that Rachel Carson identified in her landmark book, was a principal threat to the eagles.

On January 29, 2007, the USFWS removed the western Great Lakes population of gray wolves from the list. On the same day, the USFWS proposed to remove the northern Rocky Mountain population of gray wolves from the list. Visitors to Yellowstone National Park and nearby areas are now thrilled by frequent sightings of these majestic creatures after wolves were reintroduced in the 1980s.



*This historic wrought iron bridge is known as a camel back bridge for its heavy concrete structure and smooth arches. This bridge has been preserved by moving it to a new location where it now serves as a footbridge (Baraboo, WI).*

While major highway projects continue to receive close scrutiny, FHWA and State and local transportation agencies have also received recognition for their work to protect, preserve and enhance the environment. Notable achievements include replacement of impacted wetlands at a greater than 1:1 ratio, establishment of mitigation banks, exemplary ecosystem initiatives, and historic preservation of transportation-related historic sites. The construction of the Glenwood Canyon portion of I-70 in Colorado is considered both an engineering marvel and a superb example of protection of environmental resources.

The past 37 years have also brought major changes in how we work with key environmental laws. In 2005, SAFETEA-LU brought the first substantive changes in Section 4(f) since 1966. SAFETEA-LU also created important changes in transportation planning and the environmental review process.

While we work to continue progress in these areas, new challenges confront us. Invasive species are becoming an increasingly widespread and serious problem. Roadway mortality of endangered and threatened species, combined with increasing development consuming their vital habitat, is placing more pressure on these species. Runoff from roadways and related facilities continues to adversely impact our nation's water supplies. Highway projects are receiving greater attention with respect to global climate change, both in terms of their impact on greenhouse gas emissions and in terms of the impact of climate change on highway facilities themselves. Finally, highway planners and their partners at the Army Corps of Engineers and EPA are struggling to understand and implement confusing court decisions defining allowable impacts on wetlands.

These new challenges require us to seek ways to improve energy conservation, reduce congestion, and enhance travel demand management, including accommodating different travel modes.

*For tips on how to save energy on the road, see <http://epa.gov/climatechange/wycd/road.html> and <http://www.italladdsup.gov/drivers/index.asp>*

Other key issues that have emerged for transportation agencies include environmental justice, community impact assessment, and context sensitive solutions.

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## **EARTH DAY** from page 10

The FHWA Resource Center Air Quality, Environment and Planning Technical Service Teams are working to assist our customers in facing both traditional and new environmental challenges.



*Mountain goats used to cross U.S. 2 at Glacier National Park, MT, to get to a salt lick on the other side of the canyon. Now they can get there on rocky passageways underneath these bridges, shielded from view by tree cover and the steep hillside. Photo by Scott Jackson.*

The Air Quality Team has provided training in the emerging area of mobile source air toxics.

The Environment Team has worked closely with HQ to develop new guidance on SAFETEA-LU's Section 4(f) and environmental review provisions. The team continues to provide training on these topics, as well as historic preservation, water quality, wetlands, and the Endangered Species Act, among many others.

The Planning Team continues to work closely with HQ and planning organizations to implement the important changes that SAFETEA-LU has brought about. They continue to work to improve use of new technologies, such as geographic information systems (GIS).

For more information about Earth Day and ways to help the environment, see <http://www.earthday.gov/>

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## **PARTNERSHIPS**

### **Workshop Discusses Trends Affecting Geotechnical Community**

Such trends as innovative contracting and accelerated construction present challenges and opportunities to the civil engineering profession. In recent years the geotechnical community has been particularly attentive to industry issues affecting the design, construction and management of local and national infrastructure facilities.

As a way of fostering dialogue, spurring the development of strategies, and promoting initiatives focused on improving the built environment, the Society's Geo-Institute and the National Council for Geo-Engineering and Construction (Geo Council) hosted a workshop entitled "Trends Affecting the Geo-Community: What Does the Future Hold?" December 6-8 at ASCE's headquarters, in Reston, Virginia. The gathering was facilitated by Peter H.

Smeallie, the Geo Council's executive director, and it brought together leaders and professionals from industry, academia, and government. The discussions were based on papers authored by geotechnical engineers and other experts that focused on the following: accelerated construction; innovative contracting; asset management; context-sensitive solutions; safety; risk management; cost analysis; research, development, and training; and extreme hazard mitigation.

"We have a real challenge ahead of us," Jerry A. DiMaggio, P.E., M.ASCE, a senior geotechnical engineer for the Federal Highway Administration (FHWA), remarked at the outset of the workshop. DiMaggio, who in 2002 was named the FHWA's engineer of the year, has authored various FHWA guidelines and is recognized internationally for his expertise in geotechnical engineering. "Our stovepipe structure is inhibited when we move outside of our respective technical boxes," he said. "External issues are a difficulty for us. Our structure doesn't allow us to act as a community. We act as individuals and we act in a very reactive manner, as

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proactive. And so our main charge and challenge is to come up with an action plan that makes sense in the context of the bigger picture and the future of our profession.”

Adopting a comprehensive approach to accelerated construction is essential for performance, cost-effectiveness and various other factors related to quality and implementation, according to Ted Ferragut, P.E. M.ASCE, the president of TDC Partners, Ltd., a technology firm in Alexandria, Virginia. “Accelerated construction is about teamwork and planning, but most of all it’s about embracing a systems approach,” he observed. “For accelerated construction to work well and be effective, the geotechnical community has to understand and engage in this approach. The pressure of time is one of the biggest challenges facing construction organizations today.” Ferragut, who was formerly the chief of the FHWA’s Office of Technology Applications, also called on the geotechnical community to broaden its perspective so that it can adapt to future project delivery mechanisms, ensure key quality measurements for all products, and apply sustainable practices in using materials at construction sites.



Those presenting papers at the workshop included, back row from left, T. Michel Toole, Ph.D., P.E., M.ASCE, Jorge Martinez, P.E., M.ASCE, Edward Kavazanjian, Jr. Ph.D., P.E., M.ASCE, John E. Anderson, Ph.D., P.E., M.ASCE, Richard Marshall, P.E., M.ASCE, Paul Silvestri, M.ASCE, and William F. Brumund, Ph.D., P.E., F.ASCE. Front row from left, Ted Ferragut, P.E., M.ASCE, Jerry A. DiMaggio, P.E., M.ASCE, Susan McNeil, Ph.D., P.E., M.ASCE, S. Scott Litke, Aff.M.ASCE, and Peter H. Smeallie.

According to Jorge Martinez, P.E., M.ASCE, a construction specialist and the vice president of the Bechtel Infrastructure Corporation of San Francisco, innovative contracting, especially with regard to long-term projects involving public and private partnerships, requires adaptability and perseverance.

Martinez is currently the project manager of the Dulles Corridor Metrorail Project, a \$4-billion endeavor to extend the rail system (“Metro”) operated by the Washington Metropolitan Area Transit Authority westward 23 mi (37 km) from Falls Church, Virginia, to Washington Dulles International Airport.

“If you look at the chronology, you notice that there is not one single aspect of the project that has not changed,” Martinez said in reference to the rail project. “Everything has changed. The team has changed. The original plan has evolved from what was a combination of bus, metro, and lane widenings to strictly Metro. [This is] not because the needs weren’t there, but because the needs were being met by other things that were being developed concurrently. Our management has also changed several times. Our risk profile has changed. All of the players have changed.”

In September, Virginia’s Governor, Tim Kaine (D), decided to proceed with an elevated alignment for an important section of the Metro extension. Kaine had previously asked ASCE to convene and head an independent review panel to determine whether or not it would be feasible to construct a 4.2 mi (6.7 km) tunnel through the highly developed area of northern Virginia known as Tyson’s Corner. On July 31, the review panel issued a report stating that a tunnel would be a reasonable and cost-effective option, especially in view of the lower maintenance costs of underground tracks. But it also noted that the tunnel alternative would cost approximately \$250 million more than the above-ground option and would probably extend the project schedule by 12 months. A major factor in the governor’s decision apparently was the \$900 million – almost a quarter of the project’s estimated cost – that the federal government may contribute. This contribution will come only if the project’s overall cost falls within the “cost-effectiveness” parameters that follow from standards based largely on how much travel time a project is expected to save for riders per dollar spent.

“Anyone who enters into a large-scale public and private partnership and can accept changes and trust their own ability to keep a level head throughout the process, I think will reap some tremendous rewards,” added Martinez, who for nearly 30 years has been planning, designing, and constructing major transportation and heavy civil infrastructure projects. “The

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reward for us is an opportunity to negotiate a major contract on an open book basis. Being that it's open book, we're able to negotiate not only the fixed elements of the project – the direct costs – but we're also able to negotiate the risks. As the developer of the project, we've been working with the owner in doing all the things that owners normally do in regard to right-of-way, utilities, and the whole gamut of financial planning."

Blaine D. Leonard, P.E., F.ASCE, a senior manager for the Utah Department of Transportation, later presented findings from a discussion group that considered trends related to asset management and its advancement. "Geotechnical engineers and everybody we work with needs to recognize that, generally, we don't design static things," he said. "We design living things – things that respond to impacts and forces and influences upon them. We design things that age. I think that the general public doesn't think of an earth dam as something that ages, but it does. We have to recognize this more and get people to understand that these assets require maintenance. We need to identify the consequences of aging and improve our evaluation methods. We've got a lot of infrastructure out there that's getting older and there is a real demand to deal with it now – sometimes by replacement, sometimes by renewal, and sometimes by extension."

The geotechnical assets that the discussion group considered include earth retention systems, culverts, high-tech foundations, dams, tunnels, landfills, brownfields, erosion protectors, subsurface information, and instrumentation monitoring equipment. "Instrumentation technologies are maturing and will continue to mature to the point that we'll be able to monitor things in a continuous and real-time basis," added Leonard. "We have a lot of operation and maintenance people in the industry but fewer and fewer people who understand how to design things, especially more complex things. We need to figure out how to best understand the value of our assets and incorporate them into databases. We also need to develop inspection cycles and determine what has to happen with each of these assets and how often they should be looked at. For many of these assets, we'll have to identify remaining life and assess performance."

## WORKSHOP ADDRESSES GEOTECHNICAL TRENDS

At the close of the workshop, ASCE's president, W. F. Marcuson III, Ph.D., P.E., Hon. M.ASCE –the president of William F. Marcuson III & Associates, Inc., in Vicksburg, Mississippi, and the director emeritus of the Geotechnical and Structures laboratory at the U.S. Army Corps of Engineers' Waterway Experiment Station, also in Vicksburg – spoke briefly about the challenges confronting tomorrow's engineers and thanked participants for their involvement and support. "I think the biggest wolf out there right now is the offshoring of our civil engineering work," he said. "If we're ever going to be successful in competing in the globalized world, then we're going to have to move civil engineering up the food chain. I've taken on, as the theme of my watch as president, the task of preparing the civil engineer for the future, and I'm thrilled that this is also a topic of concern at this workshop. The future of civil engineering is important to me. The future of geotechnical engineering is important to me. I thank you for your interest and participation in this very worth and pressing endeavor."

The findings of the workshop – especially ideas that arose in the discussion groups – will be incorporated into a document and sent to participants for review and revision. A final report is expected to be available sometime in 2007.

--Mark Fitzgerald

ASSOCIATE EDITOR, *ASCE News*

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## CENTERED ON QUALITY

### Resources Improved in 2007- Now more Financial Services!

The Resource Center recently added a new dimension to the financial services it provides by creating a new, specialized Technical Service Team (TST). The new team, led by Team Leader Robert Clark, is the Finance Services TST. This team provides Division Offices organizational and financial assessments to assist in identifying critical performance and process improvement needs. They assist Divisions with the implementation and refinement of tools designed to improve program stewardship efforts including risk assessment, FIRE Order requirements, project funds management and quality management improvement strategies. The team also works closely with the Office of the Chief Financial Officer (OFCO) to disseminate financial management policy guidance to Divisions as well as coordinate and perform special reviews with its contractors or the Office of Inspector General. They provide training to both Divisions and State DOTs on matters of traditional Federal-aid financing, internal controls, DELPHI/FMIS reconciliations, accounting systems and indirect cost allocation plans.

#### FINANCE SERVICES TST

<b>Robert Clark</b>	<i>Team Leader</i>	<b>(410) 962-0104</b>
<b>David Dickson</b>	<i>Financial Management Specialist</i>	<b>(360) 753-8078</b>
<b>John Jeffers</b>	<i>Internal Controls Specialist</i>	<b>(404) 562-3578</b>
<b>Gina Laney</b>	<i>Financial Management Specialist</i>	<b>(404) 562-3919</b>
<b>Danial Parker</b>	<i>Financial Management Specialist</i>	<b>(720) 963-3216</b>

The second finance-focused team, led by Thay Bishop, is tasked with providing project finance assistance to its customers. The team is known as the Innovative Finance Team – easy to remember if you think of them as helping you come up with innovative ways to pay for transportation projects. The team offers transportation finance advisory services on financing alternatives, including lease and leveraging leases, short and long-term tax-exempt bond financing, Private Activity Bonds and compliance, Federal and State credit assistance programs (TIFIA, State Infrastructure Banks, Section 129 Loans), and public-private-partnership venture/

arrangements. The TST also coordinates with the OCFO and other Headquarters program offices, providing expertise on multi-year capital plans, financial plans and forecasts, asset management, and innovative revenue sources. The Innovative Finance TST designs project-specific, customized training and workshops for States, in addition to offering on-site implementation and technical assistance. The TST conducts training for all levels of the customer organization, serving as a catalyst for change by sharing and promoting best practices, and lessons learned. The Innovative Finance technical experts demonstrate how to apply and put into practice innovative finance alternative techniques to advance State capital programs. By focusing on “real world” issues, customers can transform these techniques into skills, actions, and solutions.

#### INNOVATIVE FINANCE TST

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The Resource Center has teams in the following disciplines that serve the Division Offices and other customers across the country and internationally.

#### Resource Center Services

<b>Discipline</b>	<b>Team Leader</b>	<b>Phone</b>
<b>Air Quality</b>	<b>Bob O'Loughlin</b>	<b>(415) 744-3823</b>
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<b>Finance Services</b>	<b>Robert Clark</b>	<b>(410) 962-0104</b>
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<b>Planning</b>	<b>Lisa Randall</b>	<b>(720) 963-3209</b>
<b>Safety &amp; Design</b>	<b>Pat Hasson</b>	<b>(708) 283-3595</b>
<b>Structures</b>	<b>Shoukry Elnahal</b>	<b>(410) 962-2362</b>

## CENTERED ON RESULTS

### TEAM HIGHLIGHT: California Division Office and Resource Center Partner for Award Winning Effort

The FHWA Resource Center Environment Technical Service Team (ENV-TST) has learned that its staffs' efforts have paid off in California.

The FHWA Headquarters' Office of Natural and Human Environment has recognized a project in California with the "FY 06 National Environmental Streamlining Excellence Award."

The award was presented to Federal Highway Administration (California Division Office and Stephanie Stoermer, an Environmental Specialist with the ENV-TST), Caltrans, and the Environmental Protection Agency, who jointly spent several years collaborating to produce the *Cumulative and Indirect Impacts Guidelines*.

Stoermer gave a presentation about the development of the guidance during the FHWA Environmental Conference in June 2006. The awards presentation ceremonies will take place on May 22 during the "International Conference on Ecology and Transportation," which will be held in Little Rock Arkansas, May 21-25.

The guidance document, produced through the cross agency partnership, provides practical, flexible approaches for identifying cumulative impacts and growth-related, indirect impacts as well as for preparing solid and appropriate analyses. Although the guidance was designed for transportation projects in California, it has served as a model for similar guidance in other States.

Congratulations to all! Well done!

## FHWA Resource Center Welcomes New Team Members



### CIVIL RIGHTS

#### **BOB COSGROVE**

Civil Rights Specialist

**(410) 962-0089**

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Bob Cosgrove joins the Civil Rights Technical Service Team by way of the FHWA New Jersey Division Office, where he had worked from 1999 to the present. His career in the civil rights field actually began nearly 10 years before that (in 1990) while working for the U.S. Department of Education in New York. His areas of expertise include: the Americans with Disabilities Act/Section 504 of the Rehabilitation Act; Disadvantaged Business Enterprises (DBE); State Internal EEO; Title VI; Executive Order 12898 (Environmental Justice); Executive Order 13166 (Services to Limited English Proficient Populations); Discrimination Complaint Investigations; as well as process, program, and compliance reviews. He is also an NHI Certified Instructor. His professional highlights include: serving on several FHWA Civil Rights national task forces and committees devoted to policy clarification, best practices, and technology deployment; leading the FHWA ADA/504 Tool Kit Workgroup; being recognized as a national authority on Title II ADA and Section 504 compliance; and serving as a member of the "Conducting Reviews that Get Results" training team. Cosgrove earned his bachelor's degree in Political Science from Rutgers University.



### ENVIRONMENT

#### **DEBORAH SCHERKOSKE**

Environmental Protection Specialist

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New Resource Center Environmental Protection Specialist, Deborah Scherkoske, brings 16 years of experience in her field to the Environment Team. Joining the RC also gave her the opportunity to return to Baltimore, MD after spending 11 years living and working in the Harrisburg, Pennsylvania area. She will serve the RC's customers as a contact for the topics of

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## NEW HIRES from page 15

Section 106, Section 4(f), Public Involvement issues and more. Scherkoske earned a bachelor's degree in English Literature from Hamilton College and is currently pursuing a master's degree in Historic Preservation Planning at Cornell University. Prior to joining FHWA, she was a project manager for the State Route 23 project in Lancaster County, PA. Partially constructed over 30 years ago, the current PA 23 project was one of the first to incorporate land use planning early in the project development process.



### FINANCE SERVICES

#### DAVID DICKSON

Financial Management Specialist  
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Dave Dickson joined the FHWA Resource Center Financial Services Technical Service Team from the FHWA Washington Division. Dickson was a Management Analyst, Financial Manager, and Administrative Team Leader in the Division Office. Previously, Dickson was employed as an auditor in the Department's Office of Inspector General. Dickson is a graduate of William Paterson State University, where he obtained a bachelor's degree in Business Administration and Economics.

#### DAN PARKER

Finance Program Specialist  
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Dan Parker joins the Finance Services Technical Services Team as a Finance Program Specialist. He began working in this field in 1984, and joined FHWA in 1991. Parker's expertise lies in the areas of Federal-aid highway financing; conducting process reviews; and providing indirect cost allocation training. He is a member of the Association of Government Accountants. He earned his bachelor's degree in Finance from the University of Utah, as well as his master's degree in Public Administration.

#### DANA HAFENSTINE

Finance Program Specialist  
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Dana Hafenstine joins the Finance Services Technical Services Team as a Finance Program Specialist, after most recently serving as a Financial Manager in the FHWA Wyoming Division Office. Previously, her work experience included a post as a Senior Budget Analyst with the U.S. Department of Agriculture's Western Region, Ft. Collins, CO; and various accounting and budget analyst positions with the U.S. Air Force, the U.S. Army, and the Defense Finance Accounting Service. With 20 years of financial experience — performing financial management, grants management, budget development, execution and analysis, accounting; and contracting functions — Hafenstine has extensive knowledge about managing financial programs. She earned her associate's degree in Business and Management from the University of Maryland.



### SAFETY & DESIGN

#### RUDOLPH (RUDY) UMBS

Safety Specialist  
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Rudy Umbs, former FHWA Chief Safety Engineer, has brought his expertise to the Resource Center as the newest member of the Safety & Design Team. Umbs will be based out of the Olympia Fields office and will make Milwaukee, Wisconsin his home. During his 37-year FHWA career, Umbs has held Headquarters and Field positions in virtually every aspect of highway safety including legislation, Strategic Highway Safety Plans, Highway Safety Improvement Programs, safety design, the Manual on Uniform Traffic Control Devices, and traffic records systems. Umbs is currently teaching the Road Safety Audit and Pedestrian Safety courses along with providing technical support for the development and implementation of the States' Strategic Highway Safety Plans. Umbs serves as the Secretary to the AASHTO Subcommittee on Safety Management Systems. He is a Registered Professional Engineer. He is also an alumnus of Marquette University.



## New CIVIL RIGHTS TST Team Leader announced

Teresa Banks has just been named to fill the Team Leader post on the FHWA Resource Center Civil Rights Technical Service Team (TST).

Previously, Banks served as a Civil Rights Specialist on the team, where she offered expertise in the areas of Civil Rights, Disadvantaged Business Enterprises, Equal Employment Opportunity (EEO) Contractor Compliance, State Internal EEO, Indian Preference, Prevention of Sexual Harassment, Diversity, and Title VI.

She began working in the civil rights field in 1978 for the U.S. Forest Service. From 1980 through 1988, she worked as a Civil Rights Specialist for the then-FHWA Region 10 Office serving Alaska, Idaho, Oregon, and Washington State. She moved on to serve as the Regional Civil Rights Director, from 1988-1999 in Denver CO, serving Colorado, Montana, Utah, South and North Dakota, and Wyoming, before joining the FHWA Resource center staff in Atlanta where she worked to meet the needs of 14 Southeastern States.

Banks attended Portland State University and ultimately earned her bachelor's degree in Business Management from the University of Phoenix at Colorado.

She is an NHI Certified Instructor. In addition, her many professional accomplishments include: serving on several national task forces and committees, and as Conference Chairperson for civil rights conferences, an advisor for Regional and National Conferences, and an advisor for Civil Rights Executive Councils.

### UPDATE from page 5

- Winter Maintenance snow and ice control solution – A PDS is being considered to highlight important advancements in snow and ice control. Through the use of variable orifice nozzles on machines engaged in anti-icing/de-icing and the prewetting of salt spread on roadways, significant performance improvements can be made. This easy-to-implement change in current practices not only contributes to safer wintertime driving but can also reduce the usage and cost of chemicals used in fighting winter storm problems. We are currently looking for a site to hold this PDS.



For more information on a PDS or how you can participate in one, please contact:

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